REMARKS

Applicant has carefully considered the positions of the Examiner, and respectfully requests reconsideration based upon the manifest differences between the claimed invention and the cited references.

In the September 12, 2003 Office Action, the Examiner rejected Claims 1, 3-4, 6, 16-17, 19-20, 24-25 and 27 under 35 U.S.C. §102(b) as being anticipated by Atkinson U.S. Patent No. 5,301,537 ("Atkinson"), Claims 16, 23 and 25-26 under 35 U.S.C. §102(b) as being anticipated by Sharp U.S. Patent No. 4,713,963 ("Sharp"), and Claims 1-15 and 17-22 under 35 U.S.C. §103 as being unpatentable over Sharp in view of knowledge commonly held in the art. For clarification purposes, and not for any reasons related to patentability, applicant has amended claims 1-2, 5, 7, 16-22 and 25. Also, applicant has cancelled claims 6 and 8-14 as being duplicative in light of the amended claims, and added new claims 28-38. No new matter has been added.

In rejecting independent claims 1, 16 and 25, the Examiner suggests that Atkinson discloses a capillary having multiple sections configured to provide a removable interface between an ion source and a first vacuum region of a mass spectrometer. Applicant respectfully disagrees. Briefly, Atkinson teaches an apparatus for detecting halocarbon refrigerant leaks comprising removable probes 59 (see Fig. 2) which workers use to inspect refrigeration systems. According to Atkinson, removable probes 59 are coupled to capillary tubes 56, 58 via one or more detachable connectors 62 (see col. 5, line 53 through col. 6, line 33). Capillary tubes 56, 58 are then connected to capillary 52 via valve 54 such that "a sample of the atmosphere to which probes 59 are exposed is drawn continuously to the instrument and is provided at low pressure in

the tee fitting 26 and detector chamber 12." Importantly, nowhere does Atkinson teach or suggest a multiple part capillary for introducing **ions** from an elevated pressure ion source into a vacuum system. Rather, Atkinson merely discloses a system in which analyte sample gas is leaked into a vacuum system through a capillary. Once in the vacuum system, the sample gas is ionized for mass spectrometric analysis. This is very different from applicant's novel system as claimed.

Accordingly, at least two distinctions are readily apparent between Atkinson and the present claimed invention. First, nowhere does Atkinson teach a removable interface for two capillary sections such that ions may be delivered from an ionization source region into a first vacuum region of a mass spectrometer through the two capillary sections. Rather, a system according to Atkinson is such that the capillary tubes (i.e., capillaries 52, 65, 58 & 64) are always exposed to atmospheric pressure. A vaccum is not maintained until flow-restricting device 44 and not by any structure related to the interconnection of the capillaries. This is very different from the claimed invention.

Second, Atkinson fails to teach a means for providing a substantially airtight seal between an ionization source region and a first vacuum region such that a low pressure is substantially maintained within the first vacuum region upon decoupling of a first capillary section from a second capillary section. Rather, the system of Atkinson merely teaches use of conventional flow restriction device 44 and valve 42 positioned just before low pressure entry chamber 34 in order to maintain the low pressure in entry chamber 34 and detector 12. The system of Atkinson including the conventional flow restriction device and valve is very different from the claimed invention.

In contradistinction, the present invention (as reflected in the amended and new claims) teaches a multiple part capillary for removably interfacing an ionization source region and a first vacuum region maintained at a pressure substantially lower than atmospheric pressure. Such a novel device allows a user of a mass spectrometer to more easily and quickly replace, remove, or clean part of the capillary structure or the interface (i.e., between experimental runs, if a new sample is to be tested, etc.) — which exposes the inlet orifice of at least part of the capillary structure to substantially atmospheric pressure — without having to shut down the entire vacuum system of the analyzer. Thus, with the present invention users no longer have to wait excessively long times to pump the analyzer's chambers down to the extremely low pressure levels that are required for analysis. Nowhere does Atkinson teach such a device, nor even suggest a solution to this deficiency with conventional analytical instruments. In fact, because the capillaries (i.e., 52, 56, 58 & 64) of the Atkinson device are designed to always be exposed to atmospheric pressure (see col. 6, line 67 through col. 7, line 13), it cannot be said that the system or device of Atkinson even relate to the problem recognized by the applicant, let alone solve the problem. Thus, Atkinson cannot and does not anticipate applicant's novel invention as claimed.

Therefore, applicant respectfully submits that the Examiner's rejection of claims 1, 16, and 25 as being anticipated by Atkinson should be reconsidered and withdrawn. In addition, because dependent claims 3-4, 6, 17, 19-20, 24, and 27 merely add further limitations to independent claims 1, 16 or 25, applicant submits that the rejection of these claims as being anticipated by Atkinson should be reconsidered and withdrawn as well.

Next, the Examiner rejected claims 16, 23 and 25-26 as being anticipated by Sharp. In the Examiner's opinion, Sharp discloses a "multiple part capillary device configured to

provide a removable interface between the ion source and a first vacuum region of the mass spectrometer." Applicant disagrees, and submits that the device disclosed by Sharp is merely designed to interface a gas chromatography system to a mass spectrometry system. In other words, nowhere does Sharp teach or suggest a multiple part capillary for introducing ions from an elevated pressure ion source into a vacuum system of a mass spectrometer. Rather, the device according to Sharp merely allows for the introduction of an analyte gas sample into a vacuum system. Once in the vacuum system, the sample may then be ionized for subsequent analysis.

Additionally, Sharp nowhere addresses any of the problems solved by applicant's invention. In other words, Sharp does not disclose or discuss anywhere a multiple part capillary device designed to removably interface an ionization source to a first vacuum region in a mass spectrometer system. Instead, Sharp discloses a device for analyzing samples containing organic compounds using gas chromatography. A device according to Sharp consists of an interface connected with an inlet port of a mass spectrometer, where the interface functions as a vacuum interlock through use of an isolation valve. Furthermore, when the isolation valve is closed, the sample introduction capillary is connected between a very long flow control capillary. Next, the isolation valve exposes the capillaries to the vacuum through a slight opening, thereby reducing the pressure before the isolation valve is fully opened. In other words, Sharp discloses coupling two capillaries using a sliding union 6 (see, e.g., FIGs. 1, 2, 6-8) that butts two capillaries against each other. Importantly, sliding union 6 does not substantially maintain the pressure within region 11 (see FIG. 8) if one end of union 6 is left open to the atmosphere (e.g., if capillary 15 is removed). Instead, Sharp requires an isolation valve (e.g., valve 17), an additional component, for such purpose. Thus, Sharp cannot and does not anticipate applicant's novel invention as

claimed.

Therefore, applicant submits that the Examiner's rejection of claims 16 and 25 as being anticipated by Sharp should be reconsidered and withdrawn. In addition, because dependent claims 23 and 26 merely add further limitations, to independent claims 16 and 25, applicant submits that the rejection of these claims in view of Sharp should be reconsidered and withdrawn as well.

Finally, the Examiner rejected Claims 1-15 and 17-22 under 35 U.S.C. §103 as being unpatentable over Sharp in view of knowledge commonly held in the art. Initially, applicant submits that Claims 1-15 and 17-22 are allowable in light of the amendments and remarks provided above. In addition, in the opinion of the Examiner, the "press fit" coupling of Sharp is equivalent to applicant's claimed union. Applicant respectfully disagrees. Importantly, Sharp's press-fit coupling fails to teach or suggest a device that is capable of substantially maintaining the vacuum in an analyzer's analysis regions when one of the press-fit capillaries is removed. In fact, Sharp teaches away from the claimed union and removable interface with the incorporation of the isolation valve 17, which is necessary to maintain the low pressure of the mass spectrometer system. Therefore, applicant submits that the Examiner's rejection of Claims 1-15 and 17-22 as being unpatentable in view of Sharp should be reconsidered and withdrawn.

We are confident that the Examiner will recognize that the rejection of the pending claims in view of the cited references, either alone or in combination, was principally made with the benefit of the teachings of applicant's own specification. Such a rejection could only have been made a result of hindsight reconstruction of the applicant's invention. In fact, as set forth above, even a combination of the cited references clearly does not teach or suggest applicant's

novel claimed invention, which provides a dramatic improvement over the conventional technology. The cited references neither teach nor suggest the novel and non-obvious features of applicant's claimed invention.

CONCLUSION

In view of the foregoing, applicant respectfully submits that the present invention represents a patentable contribution to the art and the application is in condition for allowance. Early and favorable action is accordingly solicited.

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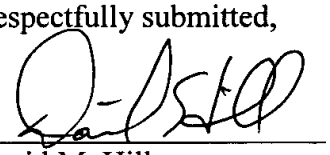
Respectfully submitted,



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